

## List of Publications

January 7, 1997

1. U. Cebulla, S. Zollner, A. Forchel, S. Subbanna, G. Griffiths, and H. Kroemer, *Hot carrier relaxation and recombination in GaSb/AlSb quantum wells*, Solid-State Electron. **31**, 507-510 (1988).
2. S. Zollner, Sudha Gopalan, M. Garriga, J. Humlíček, and M. Cardona, *Influence of deformation potential electron-phonon interaction on the optical transitions and intervalley scattering in III-V- semiconductors*, in 19th International Conference on the Physics of Semiconductors, Warsaw, 1988, edited by W. Zawadzki (Institute of Physics, Polish Academy of Sciences, Warsaw, 1988), Vol. 2, p. 1513-1516.
3. S. Zollner, Sudha Gopalan, and M. Cardona, *Intervalley deformation potentials and scattering rates in zincblende semiconductors*, Appl. Phys. Lett. **54**, 614-616 (1989).
4. S. Zollner, C. Lin, E. Schönherr, A. Böhringer, and M. Cardona, *The dielectric function of AlSb from 1.4 to 5.8 eV determined by spectroscopic ellipsometry*, J. Appl. Phys. **66**, 383-387 (1989).
5. S. Zollner, J. Kircher, M. Cardona, and Sudha Gopalan, *Are transverse phonons important for  $\Gamma X$  - intervalley scattering in GaP ?*, Solid-State Electron. **32**, 1585-1589 (1989).
6. S. Zollner, Sudha Gopalan, and M. Cardona, *Microscopic theory of intervalley scattering in GaAs:  $k$  -dependence of intervalley deformation potentials*, in *Phonons 89. Proceedings of the Third International Conference on Phonon Physics and the Sixth International Conference on Phonon Scattering in Condensed Matter*, edited by S. Hunklinger, W. Ludwig, and G. Weiss, (World Scientific, Singapore, 1990), Vol. 2, p. 787-789.
7. M. Ingels, M. Stutzmann, and S. Zollner, *Optical properties of microcrystalline silicon*, in *Materials Issues in Microcrystalline Semiconductors*, edited by P. M. Fauchet, K. Tanaka, and C. C. Tsai, (Materials Research Society, Pittsburgh, 1990), p. 229-233.
8. S. Zollner, Sudha Gopalan, and M. Cardona, *Intervalley scattering times from the rigid-pseudoion method*, in *Ultrafast Laser Probe Phenomena in Bulk and Microstructure Semiconductors III*, edited by R. R. Alfano, Proc. SPIE **1282**, 78-85 (1990).
9. S. Zollner, Sudha Gopalan, and M. Cardona, *Microscopic theory of intervalley scattering in GaAs:  $k$  -dependence of deformation potentials and scattering rates*, J. Appl. Phys. **68**, 1682-1693 (1990).
10. M. Cardona and S. Zollner, *Intra- and intervalley deformation potentials for electrons in GaAs*, in *Properties of Gallium Arsenide*, EMIS Datareview Series No. 2, 2nd edition, (INSPEC, London, 1990), p. 126-138.
11. S. Zollner, U. Schmid, N. E. Christensen, C. Grein, M. Cardona, and L. Ley, *LMTO and EPM calculations of strained valence bands in GaAs and InAs*, in 20th International Conference on the Physics of Semiconductors, edited by E. M. Anastassakis and J. D. Joannopoulos, (World Scientific, Singapore, 1990), Vol. 3, p. 1735-1738.
12. J. Fraxedas, S. Zollner, L. Ley, A. Stampfl, R. C. G. Leckey, and J. D. Riley, *Angle resolved constant initial state spectroscopy of GaAs*, in 20th International Conference on

- the Physics of Semiconductors*, edited by E. M. Anastassakis and J. D. Joannopoulos, (World Scientific, Singapore, 1990), Vol. 3, p. 1751-1754.
13. S. Zollner, U. Schmid, N. E. Christensen, and M. Cardona, *Conduction-band minima of InP: Ordering and absolute energies*, Appl. Phys. Lett. **57**, 2339-2341 (1990).
  14. S. Zollner, S. Gopalan, M. Garriga, J. Humlíček, L. Viña, and M. Cardona, *Ultrafast initial relaxation of hot electrons and holes in tetrahedral semiconductors via deformation potential interaction: Theory and experiment*, Appl. Phys. Lett. **57**, 2838-2840 (1990).
  15. S. Zollner, S. Gopalan, and M. Cardona, *Effective deformation potentials in the description of time-resolved and hot-electron luminescence*, Solid-State Commun. **76**, 877-879 (1990).
  16. S. Zollner, M. Garriga, J. Humlíček, S. Gopalan, and M. Cardona, *Temperature dependence of the dielectric function and the interband critical-point parameters of GaSb*, Phys. Rev. B **43**, 4349-4360 (1991).
  17. C. H. Grein, S. Zollner, and M. Cardona, *Theory of second order Raman scattering in silicon under uniaxial stress*, Phys. Rev. B **43**, 6633-6641 (1991).
  18. S. Zollner, S. Gopalan, and M. Cardona, *The temperature dependence of the band gaps in InP, InAs, InSb, and GaSb*, Solid-State Commun. **77**, 485-488 (1991).
  19. C. H. Grein, S. Zollner, and M. Cardona, *Calculation of the intervalley scattering rates in  $Al_xGa_{1-x}As$ : Effects of alloy and phonon scattering*, Phys. Rev. B **44**, 12761-12768 (1991).
  20. S. Zollner, S. Gopalan, and M. Cardona, *Microscopic theory of intervalley scattering in InP*, Phys. Rev. B **44**, 13446-13451 (1991).
  21. M. Cardona, C. H. Grein, H. D. Fuchs, and S. Zollner, *Isotope effects on the electronic excitations and phonons in semiconductors*, J. Non-Crystalline Solids **141**, 257-264 (1992).
  22. K. Pierz, M. Stutzmann, S. Zollner, W. Beyer, and C. Brillert, *Structural properties of Li-doped hydrogenated amorphous silicon*, J. Non-Crystalline Solids **137&138**, 107-110 (1991).
  23. S. Zollner, S. Gopalan, and M. Cardona, *Short-range deformation-potential interaction and its application to ultrafast processes in semiconductors*, Semicond. Sci. Techn. **7**, B137-B143 (1992).
  24. S. Zollner, M. Cardona, and S. Gopalan, *Isotope and temperature shifts of direct and indirect band gaps in diamond-type semiconductors*, Phys. Rev. B **45**, 3376-3385 (1992).
  25. S. Zollner, C. H. Grein, and M. Cardona, *Alloy versus phonon contributions to intervalley scattering*, in *Ultrafast Laser Probe Phenomena in Bulk and Microstructure Semiconductors IV*, edited by R. R. Alfano, Proc. SPIE **1677**, 75-84 (1992).
  26. S. Zollner, R. T. Collins, M. S. Goorsky, P. J. Wang, M. J. Tejwani, J. O. Chu, and B. S. Meyerson, *Photoluminescence from pseudomorphically strained  $Si_{1-x}Ge_x/Si$  quantum wells grown on silicon*, in *Spectroscopic Characterization Techniques for Semiconductor Technology IV*, edited by O. J. Glembocki, Proc. SPIE **1678**, 81-88 (1992).
  27. K. Eberl, S. S. Iyer, S. Zollner, J. C. Tsang, and F. K. LeGoues, *Growth and strain compensation effects in the ternary  $Si_{1-x-y}Ge_xC_y$  alloy system*, Appl. Phys. Lett. **60**, 3033-3035 (1992).

28. M. A. Tischler, R. T. Collins, J. C. Tsang, J. H. Stathis, J. L. Batstone, and S. Zollner, *Optical Characteristics of porous silicon*, in *Light Emission from Silicon*, edited by S. S. Iyer, R. T. Collins, and L. T. Canham, (Materials Research Society, Pittsburgh, 1992), Mat. Res. Soc. Symp. Proc. **256**, 189-195.
29. J. C. Tsang, K. Eberl, S. Zollner, and S. S. Iyer, *Raman spectroscopy of  $C_ySi_{1-y}$  alloys grown by molecular beam epitaxy*, Appl. Phys. Lett. **61**, 961-963 (1992).
30. S. Zollner, M. Cardona, and S. Gopalan, *Erratum: Isotope and temperature shifts of direct and indirect band gaps in diamond-type semiconductors*, Phys. Rev. B **46**, 7337 (1992).
31. M. K. Kelly, S. Zollner, and M. Cardona, *Modelling the optical response of surfaces measured by spectroscopic ellipsometry: Application to Si and Ge*, Surf. Sci. **285**, 282 (1993).
32. J. Faul, G. Neuhold, L. Ley, J. Fraxedas, S. Zollner, J. D. Riley, and R. C. G. Leckey, *Determination of conduction band states in GaAs, InP, and InAs (110)*, Phys. Rev. B **47**, 12625-12635 (1993).
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34. S. Zollner, M. Garriga, J. Kircher, J. Humlíček, M. Cardona, and G. Neuhold, *Temperature dependence of the dielectric function and the interband critical-point parameters of GaP*, Phys. Rev. B **48**, 7915-7929 (1993).
35. S. Zollner, *Model dielectric functions for native oxides on compound semiconductors*, Appl. Phys. Lett. **63**, 2523-2524 (1993).
36. J. Faul, G. Neuhold, L. Ley, J. Fraxedas, S. Zollner, J. D. Riley, and R. C. G. Leckey, *Conduction-band states in GaSb(110) and GaP(110) at the Brillouin zone center*, Phys. Rev. B **48**, 14301-14308 (1993).
37. S. Zollner, *Selecting an Operating System, Part I: OS/2 2.X*, Computers in Physics **8**, 152-160 (1994).
38. S. Zollner, C. M. Herzinger, J. A. Woollam, S. S. Iyer, A. P. Powell, and K. Eberl, *Piezo-optical response of  $Si_{1-y}C_y$  alloys grown pseudomorphically on Si (100)*, Solid State Commun. **96**, 305-308 (1995).
39. J. Faul, G. Neuhold, L. Ley, J. Fraxedas, S. Zollner, J. D. Riley, and R. C. G. Leckey, *Conduction-band states and surface core excitons in InSb(110) and other III-V compounds*, Phys. Rev. B **50**, 7384-7388 (1994).
40. J. M. Haisch, S. Zollner, K. G. Jensen, K. Myers, and W. S. Gornall, *Characterization of femtosecond Ti:sapphire laser pulses with a commercial wavelength meter*, Proceedings of the South Dakota Academy of Science **74**, 141-148 (1995).
41. S. Zollner, *Theory of optical interband transitions in strained  $Si_{1-y}C_y$  alloys grown pseudomorphically on Si (001)*, J. Appl. Phys. **78**, 5209-5211 (1995).
42. S. Zollner, C. M. Herzinger, J. A. Woollam, S. S. Iyer, A. P. Powell, and K. Eberl, *Spectroscopic Ellipsometry and Band Structure of  $Si_{1-y}C_y$  alloys grown pseudomorphically on Si (001)*, in *Strained-Layer Epitaxy – Materials, Processing, and Device Applications*, edited by E. A. Fitzgerald, J. Hoyt, K.-Y. Cheng, and J. Bean (Materials Research Society, Pittsburgh, 1995), Mat. Res. Soc. Symp. Proc. **379**, 205-210.

43. S. Zollner, A. A. Affolder, K. E. Junge, and R. Lange, *On the origin of extra peaks in the dielectric function of  $Si_{1-x-y}Ge_xC_y$  alloys grown pseudomorphically on Si (001)*, Jpn. J. Appl. Phys. (November 1996).
44. R. Lange, K. E. Junge, S. Zollner, S. S. Iyer, A. P. Powell, and K. Eberl, *Dielectric response of strained and relaxed  $Si_{1-x-y}Ge_xC_y$  alloys grown by MBE on Si (001)*, J. Appl. Phys. **80**, 4578-4586 (1996).
45. K. D. Myers, S. Zollner, R. Lange, K. G. Jensen, J. M. Dolan, D. W. Bailey, and C. J. Stanton, *Femtosecond time-resolved reflectivity of Ge*, in *Proceedings of the 23rd International Conference on the Physics of Semiconductors*, edited by M. Scheffler and R. Zimmermann, (World Scientific Singapore, 1996), p. 673-676.
46. S. Zollner, K. D. Myers, K. G. Jensen, J. M. Dolan, D. W. Bailey, and C. J. Stanton, *Femtosecond hole dynamics in Ge studied by pump-probe reflectivity*, Solid State Commun. (submitted).
47. S. Zollner and M. Cardona, *Intra- and Intervalley deformation potentials in GaAs*, in *Properties of Gallium Arsenide*, edited by M. R. Brozel and G. E. Stillman, EMIS Datareview Series No. 16, 3rd edition, (Institute of Electrical Engineers, Stevenage, Hertfordshire, UK, 1996).
48. K. E. Junge, R. Lange, J. M. Dolan, S. Zollner, M. Dashiell, B. A. Orner, and J. Kolodzey, *Dielectric response of thick low dislocation-density Ge epilayers grown on (001) Si*, Appl. Phys. Lett. (accepted, 12/13/96).
49. Stefan Zollner, *Growth and characterization of  $Si_{1-x-y}Ge_xC_y$  alloys for use in heterojunction bipolar transistors*, The Sixth Annual Iowa Space Conference, Ames, IA, November 8-9, 1996.

### Contributions to conferences (abstract only or no review)

1. S. Zollner, Sudha Gopalan, and M. Cardona, *Deformationspotentiale und Streuraten fr Intervallestreuung*, Verhandl. DPG (VI) **24**, HL 8.4, (1989).
2. Sudha Gopalan, S. Zollner, and M. Cardona, *Intervalley Deformation Potentials and Scattering Rates in Zincblende Semiconductors*, Bull. Am. Phys. Soc. **34**, 832 (1989).
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4. C. H. Grein, S. Zollner, and M. Cardona, *Theory of second order Raman scattering in semiconductors under uniaxial stress*, Bull. Am. Phys. Soc. **35**, 234-235 (1990).
5. M. K. Kelly, S. Zollner, and M. Cardona, *Semiconductor surface optical properties from spectroscopic ellipsometry*, Bull. Am. Phys. Soc. **36**, 864 (1991).
6. M. K. Kelly, S. Zollner, and M. Cardona, *Surface differential spectroscopy with in situ ellipsometry*, Il Vuoto, Scienza e Tecnologia, (1992).
7. P. M. Mooney, S. Zollner, J. O. Chu, and B. S. Meyerson, *Properties of SiGe layers grown by UHV-CVD*, Bull. Am. Phys. Soc. **37**, 716 (1992).
8. J. Faul, G. Neuhold, L. Ley, J. Fraxedas, S. Zollner, J. D. Riley, and R. C. G. Leckey, *Determination of Conduction Band States in Five III-V-Semiconductors*, Verhandl. DPG (VI) **28**, 1446, (1993).

9. S. Zollner, C. M. Herzinger, J. A. Woollam, S. S. Iyer, A. P. Powell, and K. Eberl, *Piezo-optical response of  $Si_{1-y}C_y$  alloys grown pseudomorphically on Si (100)*, 42nd Midwest Solid-State Conference, Kansas City, Mo, October 14 to 15, 1994.
10. K. G. Jensen, J. M. Haisch, S. Zollner, and K. D. Myers, *Measurements of femtosecond laser light using a commercial wavemeter*, 42nd Midwest Solid-State Conference, Kansas City, Mo, October 14 to 15, 1994.
11. K. G. Jensen, J. M. Haisch, S. Zollner, and K. D. Myers, *Why autocorrelators for ultrafast lasers will soon be obsolete*, Bull. Am. Phys. Soc. **40**, 140 (1995).
12. S. Zollner, C. M. Herzinger, J. A. Woollam, S. S. Iyer, A. P. Powell, and K. Eberl, *Piezo-optical response of  $Si_{1-y}C_y$  alloys grown pseudomorphically on Si (100)*, Bull. Am. Phys. Soc. **40**, 277 (1995).
13. S. Zollner, K. E. Junge, and R. Lange, *On the origin of extra peaks in the dielectric function of  $Si_{1-x-y}Ge-xC_y$  alloys grown pseudomorphically on Si(001)*, The Fifth Annual Iowa Space Conference, Cedar Falls, IA, October 28, 1995.
14. K. E. Junge, A. A. Affolder, R. Lange, and S. Zollner, *On the origin of extra peaks in the dielectric function of  $Si_{1-x-y}Ge_xC_y$  alloys grown pseudomorphically on Si (001)*, 43rd Midwest Solid-State Conference, St. Louis, Mo., October 14, 1995.
15. K. Junge, R. Lange, and S. Zollner, *Spectroscopic ellipsometry and band structure of  $Si_{1-x-y}Ge-xC_y$  alloys*, Bull. Am. Phys. Soc. **41**, 420 (1996).
16. K. D. Myers, S. Zollner, R. Lange, and K. G. Jensen, *Femtosecond time-resolved reflectivity of Ge*, APS march meeting, St. Louis, MO, 1996 (post-deadline poster).
17. R. Lange, K. E. Junge, A. A. Affolder, and S. Zollner, *Spectroscopic ellipsometry and band structure of  $Si_{1-x-y}Ge_xC_y$  alloys*, MRS Spring Meeting, April 8-12, 1996, San Francisco, CA, MRS Spring Meeting Abstracts, 116 (1996).
18. S. Zollner, K. D. Myers, K. G. Jensen, J. M. Dolan, D. W. Bailey, C. J. Stanton, *Femtosecond hole dynamics in Ge studied by pump-probe reflectivity*, 44th Midwest Solid-State Conference, Lincoln, NE, October 18-19, 1996.
19. K. E. Junge, R. Lange, J. M. Dolan, S. Zollner, M. Dashiell, B. A. Orner, and J. Kolodzey, *Dielectric response of thick low dislocation-density Ge epilayers grown on (001) Si*, 44th Midwest Solid-State Conference, Lincoln, NE, October 18-19, 1996.
20. R. Lange, K. E. Junge, S. Zollner, S. S. Iyer, A. P. Powell, and K. Eberl, *Effects of biaxial stress on the band structure of  $Si_{1-x-y}Ge_xC_y/Si(001)$* , 44th Midwest Solid-State Conference, Lincoln, NE, October 18-19, 1996.
21. S.-J. Lee, R. Lange, S. Zollner, P. Canfield, B. Harmon, and D. W. Lynch, *The Magneto-Optical properties of rare earth-transition metal compounds*, 44th Midwest Solid-State Conference, Lincoln, NE, October 18-19, 1996.
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23. R. Lange, K. E. Junge, S. Zollner, S. S. Iyer, A. P. Powell, and K. Eberl, *Dielectric response of strained and relaxed  $Si_{1-x-y}Ge_xC_y$* , The Sixth Annual Iowa Space Conference, Ames, IA, November 8-9, 1996.
24. S. Zollner, *Interband hole scattering in Ge studied by femtosecond pump-probe reflectivity*, APS March Meeting 1997 (invited talk).

25. R. Lange, S.-J. Lee, S. Hong, P.C. Canfield, S. Zollner, D.W. Lynch, and B.N. Harmon, *Magneto-optical response and band structure of  $XPt_3$  ( $X=Mn, Co$ )*, APS March meeting, Kansas, City, MO, March 1997.
26. K.E. Junge, R. Lange, J.M. Dolan, S. Zollner, M. Dashiell, B.A. Orner, and J. Kolodzey, *Dielectric response of low dislocation-density Ge and Ge-rich  $Si_{1-x-y}Ge_xC_y$  alloys grown on Si (001)*, APS March meeting, Kansas, City, MO, March 1997.
27. S.-J. Lee, R. Lange, S. Zollner, P.C. Canfield, B.N. Harmon, and D.W. Lynch, *The electronic structure and magneto-optical properties of heavy rare earth- $Fe_2$  compounds*, APS March meeting, Kansas, City, MO, March 1997.
28. S. Zollner, *Spectroscopic Ellipsometry of SiGeC: Band structure, strain, composition, transport, and dislocations*, SiGeC Workshop, University of Texas, Austin, TX, April 25, 1997 (invited talk).